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OPERATING INSTRUCTIONS

MODEL ~~8625(A)~~ 870

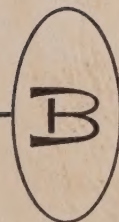
MAGNET CHARGER

870

305-678-6900

7w

ELECTRONIC DESIGN • DEVELOPMENT • MANUFACTURING



BELL INC.
COLUMBUS, OHIO



OPERATING INSTRUCTIONS

MODEL ~~8625(A)~~ 870

MAGNET CHARGER

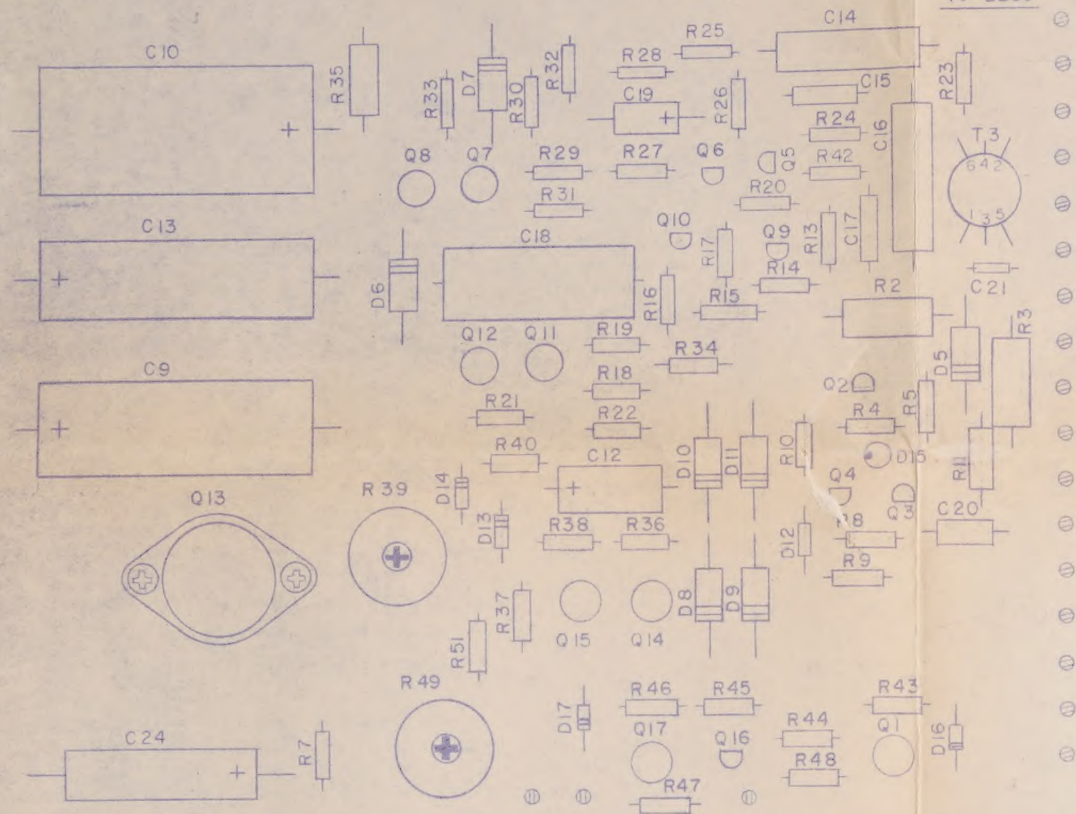
870

F. W. BELL, INC.

4949 Freeway Dr. E.
Columbus, Ohio 43229
PHONE (614) 888-7501 —
TWX (810) 337-2851

878

YC-2288



UA-2547

COMPONENT IDENTIFICATION

SYMBOL	QTY.	DESCRIPTION	FWB. PART No.	MFG.	PART No.
T3	1	P.C. BOARD	IB-1986	UTC	H51
Q16	1	PULSE TRANSFORMER	LR-01-001	MOT	2N3903
Q13	1	TRANSISTOR	JT-2N3903	MOT	2N3903
Q7,8,11,12	4	TRANSISTOR	JT-2N3611	FIA	2N3638
Q5,6,9,10	4	TRANSISTOR	JT-2N4401	MOT	2N4401
Q3,4	2	TRANSISTOR	JT-2N4061	TI	2N4061
Q1,14,15,17	4	TRANSISTOR	JT-2N1305	GE	2N1305
R47	1	RESISTOR-62 OHM 1/2 W 5% COMP.	RJ-15-62	AB	
R40	1	RESISTOR-470 OHM 1/2 W 5% COMP.	RJ-15-470	AB	
R39,49	2	RESISTOR-5K OHM POT. (NO SHAFT)	RS-01-5K	CTS	SERIES 115 TYPE 115
R37	1	RESISTOR-2.7K OHM 1/2 W 5% COMP.	RJ-15-2X7K	AB	
R35	1	RESISTOR-100 OHM 2 W 5% W.W.	RL-13-100		BWH
R33,48	2	RESISTOR-22K OHM 1/2 W 5% COMP.	RJ-15-22K		
R23	1	RESISTOR-100K OHM 1/2 W 5% COMP.	RJ-15-100K		
R21,30,44,45	4	RESISTOR-5.1K OHM 1/2 W 5% COMP.	RJ-15-5X1K		
R20,42	2	RESISTOR-110 OHM 1/2 W 5% COMP.	RJ-15-110		
R19,22,29,31,51	5	RESISTOR-10K OHM 1/2 W 5% COMP.	RJ-15-10K		
R17,28	2	RESISTOR-150K OHM 1/2 W 5% COMP.	RJ-15-150K		
R16,27	2	RESISTOR-2K OHM 1/2 W 5% COMP.	RJ-15-2K		
R15,26	2	RESISTOR-560 OHM 1/2 W 5% COMP.	RJ-15-560		
R14,25	2	RESISTOR-16K OHM 1/2 W 5% COMP.	RJ-15-16K	AB	
R11	1	RESISTOR-3K OHM 3W 5% W.W.	RL-21-3K	SPR	TYPE 242E
R10	1	RESISTOR-680 OHM 1/2 W 5% COMP.	RJ-15-680	AB	
R8,9,36,38,43,46	6	RESISTOR-3K OHM 1/2 W 5% COMP.	RJ-15-3K		
R7,13,24	3	RESISTOR-3.3K OHM 1/2 W 5% COMP.	RJ-15-3X3K		
R5	1	RESISTOR-180K OHM 1/2 W 5% COMP.	RJ-15-180K		
R4,18,32,34	4	RESISTOR-1K OHM 1/2 W 5% COMP.	RJ-15-1K		
R3	1	RESISTOR-200 OHM 2W 5% COMP.	RJ-23-200		
R2	1	RESISTOR-300 OHM 2W 5% COMP.	RJ-23-300	AB	
D16,D17	2	DIODE-SILICON	JT-1N2069	TI	1N2069
D15	1	DIODE-SILICON	JT-1N3755	RCA	1N3755
D13,14	2	DIODE-ZENER 7.5V	JF-03-7X5	MOT	MZ-500-13
D12	1	DIODE-ZENER 5.6V	JF-03-5X6	MOT	MZ-500-10
D6,7,8,9,10,11	6	DIODE-SILICON	JT-1N3193	RCA	1N3193
D5	1	DIODE-SILICON	JT-1N3195	RCA	1N3193
C24	1	CAPACITOR-350μF 15V ELECT.	CFH-47-350	SPR	TE-1166
C21	1	CAPACITOR-.00047μF 200V ELECT.	CLP-11-X00047		192P-47192
C20	1	CAPACITOR-.015μF 200V ELECT.	CLP-11-X015		192P-15392
C19	1	CAPACITOR-10μF 15V ELECT.	CFH-47-10		TE-1158
C18	1	CAPACITOR-.33μF 200V ELECT.	CLP-01-X33		220P-2PS-P33
C15,17	2	CAPACITOR-.0068μF 200V ELECT.	CLP-11-X0068		192P-68292
C14,16	2	CAPACITOR-.22μF 200V ELECT.	CLP-11-X22		192P-22492
C13	1	CAPACITOR-1200μF 15WVDC ELECT.	CFH-48-1200		39D-128G015FL4
C12	1	CAPACITOR-100μF 15V ELECT.	CFH-47-100		TE-1162
C10	1	CAPACITOR-4000μF 15WVDC ELECT.	CFH-48-4000		39D-408G015JL4
C9	1	CAPACITOR-1000μF 25WVDC ELECT.	CFH-57-1000	SPR	39D-108G025GL4

MATERIAL	7w COLUMBUS, OHIO U.S.A. BELL INC		SHEET OF	EC.O. NO.	DATE BY	REV.
FINISH	SCALE NONE	DWG 23, OCT. 70 JH	TITLE	ASSEMBLY DWG-P.C. BOARD		
	DEC. 1	CKD 10, NOV 70 DF		MODEL CS-6040 MAGNETIZER		
	DIVISION	FRAC. 1	APR 10, NOV 70 DF	ISSUE DATE	SEP 11 1972	DWG. NO.
DEV DWG NO	ANG. 1	REL 10, NOV 70 DF				YC-2288

OPERATING INSTRUCTIONS

MODEL 8625(A)

MAGNET CHARGER

SECTION I

General Description:

The Model 8625(A) Magnet Charger is a versatile capacitor discharge magnetizer (impulse magnetizer), designed for use with all types of magnetic materials. The unit has a maximum energy storage capacity of 450 watt-seconds in 10,000 microfarads of capacitance. The capacitor voltage is automatically controlled by solid state circuitry and can be maintained at any required level between 35 and 300 volts. A maximum peak charging current of 6,000 amperes can be supplied to a magnetizing fixture. The 8625(A) has been designed for simplicity and versatility. Provisions are provided for remote triggering and signals are available, at the rear panel binding posts, for process automation.

SECTION II

Specifications:

Charging Energy:

8625- 450 Watt-seconds max.

8625A-787 Watt-seconds max.

Operating Voltage:

35 to 350 volts

Maximum Charging Current:

6,000 A peak (must be limited
by magnetizing fixture).

Recycle Time (typical at
rated line voltage):

10 seconds to 300 volts

2.8 seconds to 250 volts

1.8 seconds to 200 volts

1.4 seconds to 150 volts

Rear Panel Binding Posts:

(1) Red (1), yellow (2),
and yellow (3):

a) Contact closure between 1 and 2
provides external trigger

b) Jumper between 2 and 3 provides
for triggering from front panel
"Push to Magnetize" switch.
Removing this jumper disables
the front panel switch.

(2) Yellow (8) and Red (9):

Provides output signal (12 V at
300 mA maximum)* indicating
"magnetizing complete".

(3) Yellow (6) and Black (7):

Test point for observation of
voltage proportional to magnetizing
current pulse and energy storage
capacitor charging current.

*See page 3 under "OPERATION" for details

OPERATING INSTRUCTIONS

MODEL 8625(A)

(4) Red (4) and Black (5):

Provides output signal (18 V at 300 mA maximum)* indicating unit is ready to recycle.

Power Requirement:

117 Vac, 60 Hz, 15 A

Dimensions:

17" deep, 23 1/2" wide, 16" high

Weight:

Approximately 100 lbs.;
Shipping weight 150 lbs.

SECTION III

Operating Instructions:

A) Magnetizer:

1) Preliminary:

The Model 8625(A) Magnet Charger utilizes an SCR.

The magnetizing fixture is connected to the Model 8625(A) through two Superior Electric 50 Ampere "Supercon" electrical connectors and a ground terminal. The ground terminal is connected through the chassis to ground when the A C power cord is plugged into the proper receptacle. There is no potential at the fixture terminals except at the instant of discharge. This unit will not discharge without a fixture being connected.

2) Operation

The three conductor power cord should be connected to a 117 V A C 60 Hz 15 A source. To insure the safety of the operator, be sure, the system is properly grounded. If the "Push to Magnetize" switch (S2) is to be used, a jumper must be placed between yellow

*See page under "OPERATION" for details

OPERATING INSTRUCTIONS

MODEL 8625 (A)

binding post (2) and yellow binding post (3) on the rear panel. Before turning the unit on, the "Voltage Control" should be set fully CCW (min). This will allow the first discharge through the fixture to be minimum, thus allowing a safe operational check on the system. The voltage can then be raised to maximum by rotating the voltage control in the clockwise direction. The magnitude of current discharged through the magnetizing fixture will be a function of the voltage and the fixture design. Any magnetizing fixture used must be designed to limit the peak current to 6,000 A or less.

Both the discharge current and capacitor charging current can be observed on a sensitive oscilloscope (1^{mV} /cm or greater) by using the 8625(A) internal shunt. This shunt has an approximate sensitivity of .1 mV / A and is connected to the yellow (6) and black (7) binding posts on the rear panel. A shield lead from these binding posts to the oscilloscope will give the best results. The oscilloscope must not be grounded except from the black binding post (7). If the oscilloscope being used is provided with a 3-wire cord, use an adapter and do not connect the ground lead.

The yellow (8) and red(9) rear panel binding posts provide an output signal when the magnetizing function has been completed. This is a 12 V source which can be used to drive external lights or relay circuitry. Any load used must be designed to limit the current to 300 mA or less. Use extreme care when connecting this circuit. An accidental short between terminals 4 and 5 can result in permanent damage to transistor Q8.

The red (4) and black (5) rear panel binding posts provide an output signal when the energy storage capacitors have reached their preset charge level and the unit is ready to magnetize. This is an 18 V source which can be used to drive external lights or relay circuitry. Any load used on these terminals must be designed to limit the current to 300 mA or less. Use extreme care when connecting this circuit. An accidental short between terminals 8 and 9 can result in permanent damage to transistor Q1.

B) Fixture:

CAUTION: Any special fixture used with the 8625(A) must limit the current to 6,000A or less.

A standard general purpose fixture (Model CS-602) is available for use with the 8625(A). Specific applications may require the design of special coils. A pair of connectors is supplied with each 8625(A) to facilitate easy attachment of special coils.

General techniques for fixture construction are pictured in figures 1 and 2. Both sketches show a high permeability metallic return path for the magnetizing field. Many cases, involving magnets of small

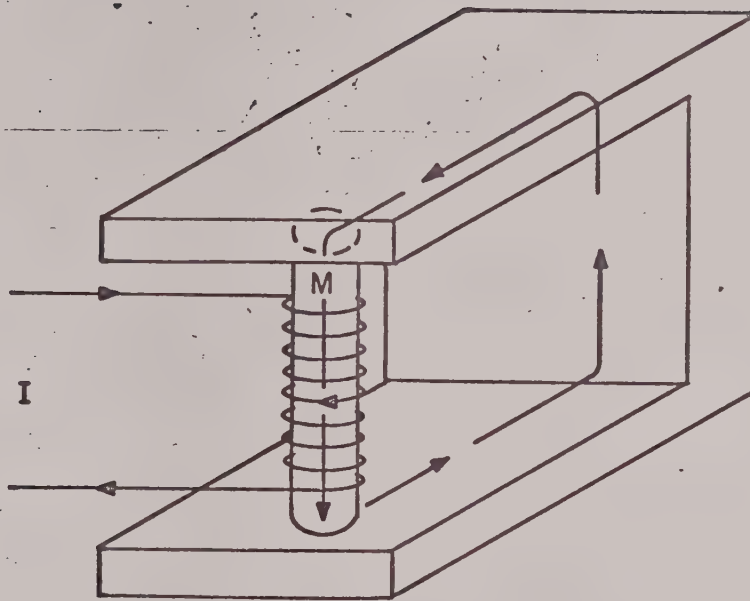


FIG. 1
CYLINDRICAL, BAR, OR ROD TYPE MAGNETS

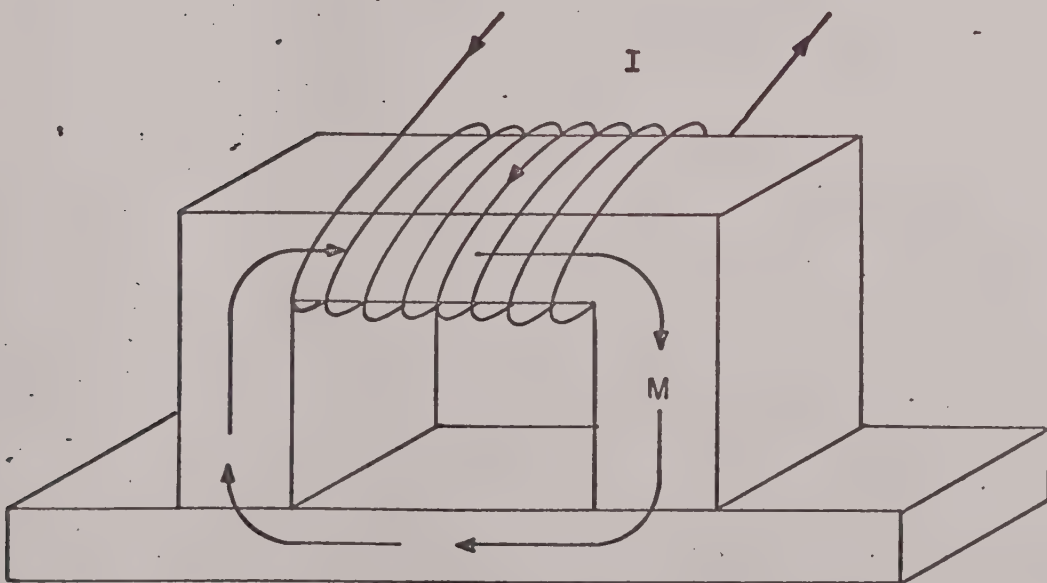


FIG. 2
HORSESHOE AND "U" TYPE MAGNETS



OPERATING INSTRUCTIONS

MODEL 8625 (A)

volume and high length to diameter ratio, this return path will be unnecessary. The number of turns is not critical for smaller magnets, as long as the field produced is sufficient to saturate the part. Larger magnets and magnet assemblies, containing appreciable amounts of aluminum or other metals, may require more turns to produce longer pulse lengths. These types of magnets develop eddy currents which oppose the magnetizing field and prevent complete magnetization. Fixtures must therefore, be designed so that the charging impulse has sufficient duration to allow these eddy currents to decay while the charging impulse remains near its maximum amplitude. Increasing the number of turns will increase the pulse length, however it also decreases the impulse current peak amplitude for a given capacitor voltage. Any special fixture must be optimized by actual testing.

SECTION IV

Theory of Operation

A) General:

The 8626(A) Magnet Charger consists of eight basic operating blocks. Refer to Block Diagram UB-2115. The "Low Voltage Power Supply" supplies - 12 V unregulated and + 12 V regulated to all control circuitry. The "High Voltage Power Supply" acts as a current limiter when supplying current to the "Energy Storage Capacitors". The "Comparator" monitors the "Energy Storage Capacitor" voltage, continually comparing it with a reference. If the capacitor voltage is below the preset level of the "Voltage Control" the "Voltage Control Switch" is closed allowing current to flow into the "Energy Storage Capacitors". When the capacitor voltage equals the reference the "Voltage Control Switch" opens. This preset voltage is automatically maintained, until the unit is triggered. The application of a trigger pulse activates both the "Recharge Delay Circuit" and the "High Current Switch Trigger". The "Recharge Delay Circuit" immediately sends a blocking signal to the "Voltage Control Switch" holding it open for approximately one second. During this holding period, "High Current Switch Trigger" delays for about 10 millisecond, then closes the "High Current Switch" allowing the stored energy to dissipate in the fixture. When the fixture current decays below the holding current of the SCR, the "High Current Switch" opens. At the end of the one second holding period the "Voltage Control Switch" closes allowing the "Energy Storage Capacitors" to recharge. A front panel light indicates when the capacitors have recharged to any preset level and the unit is ready to recycle.

OPERATING INSTRUCTIONS

MODEL 8625 (A)

SECTION V

Maintenance

A) Test Equipment:

The following tests will require the use of a high impedance dc voltmeter having 2% or better accuracy such as a Hewlett-Packard Model 412A and an oscilloscope having response to DC such as a Tektronix 503. Refer to Schematic Diagram UD-2507 for location of all parts referenced.

B) Adjustments:

1. Meter Mechanical Zero:

Turn the unit off and allow several minutes for all capacitors to discharge. It is advisable to short the meter terminals with a wire jumper. Position the unit in its normal horizontal operating position and adjust the screw on the meterface to bring the pointer to exactly zero. Read the meter accurately by aligning the pointer with its image in the mirror.

For the following adjustments, remove the PC Board from the chassis and place it on a working surface beside the unit. Turn the unit on being careful to avoid short circuits.

2. Power Supply Adjustment:

The -12V portion of the power supply is regulated and can be adjusted by R39. Connect a DC voltmeter across C13 and adjust R39 for a 12V reading.

3. Voltage Control Adjustment:

Connect the DC meter from chassis to the negative capacitor plate. Turn the front panel "Voltage Control" fully clockwise and allow the voltage to increase until the "Push to Magnetize" switch lights. The meter should read -350 volts. If the voltage is low adjust R49 until it increases to 350 V. If the voltage is high, connect a fixture and cycle the 8626(A) several times, adjusting R49 until the final voltage is 350. The front panel meter should agree with the test voltmeter within 5%.

OPERATING INSTRUCTIONS

MODEL 8625(A)

C) Performance Test:

Connect an oscilloscope to rear panel binding posts 6 and 7. Do not ground scope except from binding post 7. Trigger the scope sweep externally from rear panel binding post 1. A resulting wave form similar to that shown in Fig. 3 indicates proper operation.

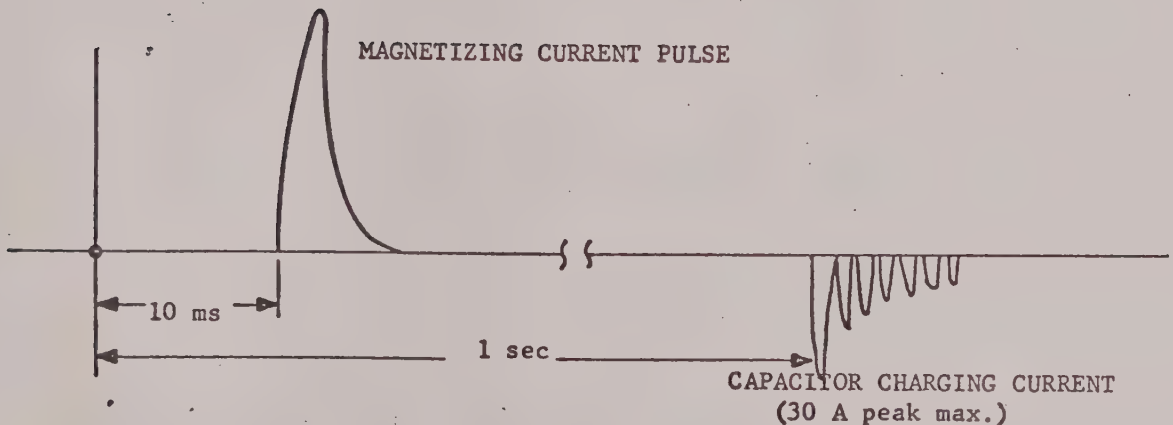


FIG. 3

OPERATING INSTRUCTIONS

MODEL 8625(A)

SECTION VI

Warranty

F. W. BELL, INC. warrants each instrument of its manufacture to be free from defects in material and workmanship. Our obligation under this warranty is limited to servicing or adjusting any instrument returned to our factory for that purpose, and to replacing any defective parts thereof (excluding electron tubes, batteries, transistors and probe sensing elements, which parts are covered by a standard EIA 90-day warranty). This warranty covers instruments which, within one year after delivery to the original purchaser, shall be returned with transportation charges prepaid by the original purchaser, and which upon examination shall disclose to our satisfaction to be defective. If it is determined that the defect has been caused by misuse or abnormal conditions of operation, repairs will be billed at cost after submitting an estimate to the purchaser.

F. W. BELL, INC. reserves the right to make changes in design at any time without incurring any obligation to install same on units previously purchased.

This warranty is expressly in lieu of all other obligations or liabilities on the part of F. W. BELL, INC. and F. W. BELL, INC. neither assumes nor authorizes any other person to assume for them any other liability in connection with the sales of F. W. BELL, INC. instruments.

DAMAGE IN SHIPMENT

The instrument should be examined and tested as soon as it is received. If it does not operate properly, or is damaged in any way, immediately file a claim with the carrier. The claim agent will provide report forms. A copy of the completed form should be forwarded to us. We will then make the necessary arrangements for repair or replacement. All correspondence concerning this instrument should include model and serial numbers.

SHIPPING INSTRUCTIONS

All shipments of F. W. BELL, INC. instruments should be made, via Railway Express or Motor Freight. Always use the original shipping carton and inserts, if possible, or pack the instrument in a sturdy container and surround the entire instrument with two or three inches of excelsior or similar shock-absorbing material.

OPERATING INSTRUCTIONS

MODEL 8625(A)

SECTION VI

Key to Mfg. Abbreviation

AB	ALLEN BRADLEY
AHH	ARROW-HART & HEGEMAN
AMX	AMPEREX
BEL	BELDEN MFG.
DIX	DIXSON INC.
FAI	FAIRCHILD
GE	GENERAL ELECTRIC
MOT	MOTOROLA
OHM	OHMITE
RCA	RADIO CORP. OF AMERICA
TI	TEXAS INSTRUMENT
TRD	TRIAD
UTC	UNITED TRANSFORMER CORP.
VAR	VARO INC.
WEL	WOOD ELECTRIC
NL	NATIONAL ELECTRONICS, INC.

Parts List:

<u>Schematic Reference</u>	<u>Description</u>	<u>Mfg. and Type</u>	<u>Bell Part No.</u>
Electrolytic Cap.			
C9	1000 MFD @ 25V	SPR. 39D-108G025GL4	CFH-57-1000
C13	1200 MFD @ 15V	SPR. 39D-128G015FL4	CFH-48-1200
C10	4000 MFD @ 15V	SPR. 39D-408G05JL4	CFH-48-4000
C12	100 MFD @ 15V	SPR. TE-1162	CFH-47-100
C1, C2, C3, C4, C5---7	2500 MFD @ 350V	SPR. 36D-252F350DF	CFL-46-2500
C11	3900 MFD @ 50V	SPR. 36D-392G050AC	CFL-35-3900
C19	10 MFD @ 15V	SPR. TE -1155	CFH-47-10
C24	350 MFD @ 15V	SPR. TE -1166	CFH-47-350
Capacitors			
C21	.00047 MFD @ 200V	SPR. 192P-47192	CLP-11-X00047
C15, C17	.0068 MFD @ 200V	SPR. 192P-68292	CLP-11-X0068
C20	.015 MFD @ 200V	SPR. 192P-15392	CLP-11-X015
C23	.1 MFD @ 600V	SPR. 220P-6PS-P10	CLP-05-X1
C14, C16	.22 MFD @ 200V	SPR. 192P-22492	CLP-11-X22
C18	.33 MFD @ 200V	SPR. 220P-2PS-P33	CLP-01-X33

OPERATING INSTRUCTIONS

MODEL 8625 (A)

Diodes and Silicon Controlled Rectifiers

D1,D2,D3,D4 D16,D17,D18,D19	Bridge Rectifier Diode	VAR VT-600/S TI 1N2069	JF-07-002 JT-1N2069
D6,D7,D8,D9,D10,D11 D12 D13,D14 D15 D16 SCR1 SCR2 D20	Diode 5.6 V Zener Diode 7.5 V Zener Diode Diode Thyrector Diode Silicon Controlled Rectifier Silicon Controlled Rectifier Diode	RCA 1N3193 MOT MZ-500-10 MOT MZ-500-13 RCA 1N3755 GE 6RS21A9D9 MOT 2N4172 NL C180C MOT MR-1225	JT-1N3193 JF-03-5X6 JF-03-7X5 JT-1N3755 JF-04-001 JT-2N4172 JF-09-002 JF-08-001

Tube and Transistors

Q2,Q5,Q6,Q9,Q10,Q1. Q3,Q4 Q7,Q8,Q11,Q12 Q13 Q1,Q14,Q15,Q16,Q17 Q16	Transistor Transistor Transistor Transistor Transistor Transistor	MOT 2N4401 TI 2N4061 FIA 2N3638 MOT 2N3611 TI 2N1305 MOT 2N3903	JT-2N4401 JT-2N4061 JT-2N3638 JT-2N3611 JT-2N1305 JT-2N3903
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Transformers

T1	High Voltage Power Transformer		LB-1945
T2	Low Voltage Power Transformer	TRD F-40X	LP-01-001
T3	Pulse Transformer	UTC H-51	LR-01-001

Potentiometers

R39,R49	5 K ohm Potentiometers, P.C. MTG.		RS-01-5K
R6	50 K ohm Potentiometer, CCW Log Taper		RA-1810

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Resistors

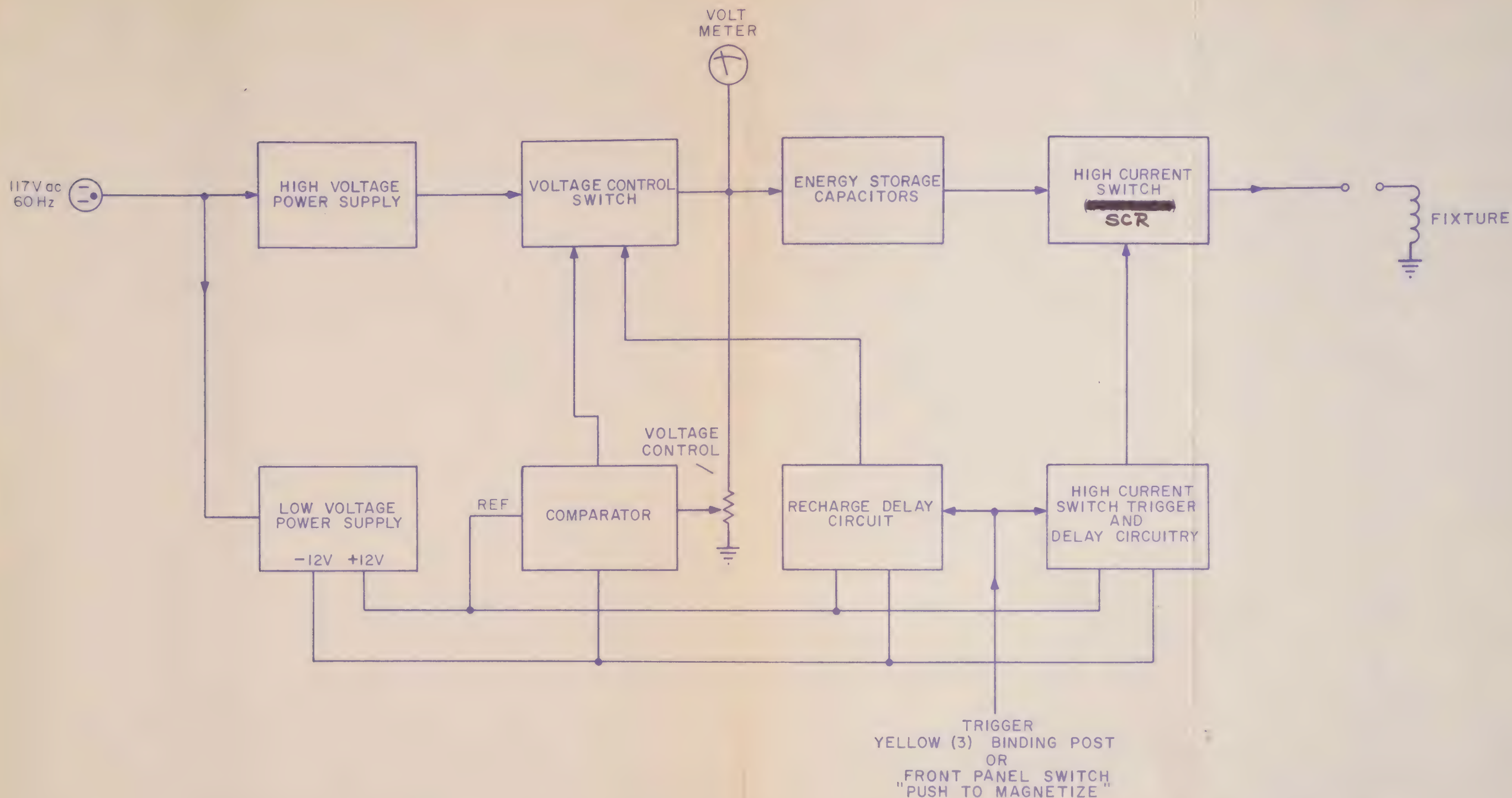
R1	1	ohm, 100 W wire wound resistor	OHM-270-100	RH-05-1
R41	1 K	ohm, 50 W wire wound resistor	OHM 270-50	RH-07-1K
R47	62	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-62
R20, R42	110	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-110
R40	470	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-470
R15, R26	560	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-560
R10	680	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-680
R4, R18, R32, R34	1 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-1K
R16, R27	2 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-2K
R37	2.7 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-2X7K
R8, R9, R36, R38	3 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-3K
R43, R46				
R7, R13, R24	3.3 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-3X3K
R21, R30, R44, R45	5.1 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-5X1K
R19, R22, R31, R29	10 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-10K
R51				
R14, R25	16 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-16K
R33, R48	22 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-22K
R23	100 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-100K
R17, R28	150 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-150K
R5	180 K	ohm, $\frac{1}{2}$ W, $\pm 5\%$ comp. resistor	AB	RJ-15-180K
R35	100	ohm, 2 W, $\pm 5\%$ wire wound res.	AB (BWH)	RL-13-100
R3	200	ohm, 2 W, $\pm 5\%$ comp. resistor	AB	RJ-23-200
R2	300	ohm, 2 W, $\pm 5\%$ comp. resistor	AB	RJ-23-300

Miscellaneous

M1	0-350 V DC voltmeter	DIX 430S10	MM-01-001
F3	.4 A Fuse (S10-B10)		QF-08-X4
P1	Neon Pilot Lamp	GE NE-51	QL-05-001
P2	Pilot Lamp	GE 330	QL-01-007
S1	Power Switch	AHH 82617	ST-01-006
F1	Circuit Breaker	BEL 375-10A	EX-01-001
	Power Cord	BEL 17461-S	WP-01-004

RL1 RELAY

Bell #10715 GUARDIAN #900-2C115A



MATERIAL		7w BELL INC. COLUMBUS, OHIO U. S. A.		SHEET OF	E.C.O. NO.	DATE BY	REV
FINISH		SCALE	DWG. 14, NOV 68 DE	TITLE 8625 BLOCK DIAGRAM			
		DEC. ±	CKD				
DIVISION		FRAC. ±	APR.	ISSUE DATE		DWG. NO.	
DEV. DWG. NO.		ANG ±	REL	SEP 11 1972		UB-2115	

REF	QTY	DRAWING NO.	DESCRIPTION	
MATERIAL & FINISH			 BELL INC COLUMBUS, OHIO	
			TITLE SCHEMATIC DIAGRAM, MODELS 8625, 8625A 8626, 8626A	
SCALE	NONE	DRN 14SER71, VELTEN		
DECT ±		CKD 15SER71, J.A.K.		
FRAC ±		APR JMC 6-20-72		
ANG ±		REL	SHT 1 OF 1 ISSUE DATE SEP 11 1972	DWG NO. UD-2862 SIZE D



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NO. T118W

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